

WHAT IS CLAIMED IS:

1. A starter/alternator system for an engine and a battery of an automobile, comprising:
 - a starter/alternator machine;
 - a three phase MOSgate control inverter/bridge electrically coupled to the starter/alternator machine, the three phase MOSgate control inverter/bridge including bridge connected MOSgated devices;
 - a control ASIC electrically coupled to the bridge connected MOSgated devices of the three phase MOSgate control inverter/bridge, the control ASIC including all control circuitry required to control the starter/alternator machine; and
 - a motor drive circuit electrically coupled to the control ASIC.
2. The starter/alternator system of claim 1, wherein the motor drive circuit includes feedback inputs electrically coupled to respective feedback signals.
3. The starter/alternator system of claim 2, wherein the feedback signals include a first feedback signal generated by the three phase MOSgate control inverter/bridge and a second feedback signal generated by the starter/alternator machine.
4. The starter/alternator system of claim 1, wherein the control ASIC is capable of operating in a plurality of different voltage networks.
5. The starter/alternator system of claim 4, wherein the plurality of different voltage networks include a 12 volt voltage network and a 42 volt voltage network.
6. The starter/alternator system of claim 1, wherein the control ASIC is capable of operating in a wide operating temperature range.

7. The starter/alternator system of claim 6, wherein the temperature range is -40°C to 165°C.

8. The starter/alternator system of claim 1, wherein the control ASIC is capable of operating in a plurality of modes.

9. The starter/alternator system of claim 8, wherein the plurality of modes include a starter mode, the control ASIC driving the bridge connected MOSgated devices of three phase MOSgate control inverter/bridge in the starter mode, such that gate-to-source voltages of the bridge connected MOSgated devices are held for a duration of a start-up sequence.

10. The starter/alternator system of claim 9, wherein the control ASIC includes at least one control input, the starter mode of the control ASIC being initiated by the assertion of the at least one control input.

11. The starter/alternator system of claim 8, wherein the plurality of modes include an alternator mode, the control ASIC driving the bridge connected MOSgated devices of three phase MOSgate control inverter/bridge in the alternator mode to rectify an alternating voltage from the starter/alternator machine.

12. The starter/alternator system of claim 9, wherein the control ASIC includes at least one control input, the alternator mode of the control ASIC being initiated by the assertion of the at least one control input.

13. A control ASIC for use in a starter/alternator system for an engine and a battery of an automobile, the control ASIC comprising:

an ASIC configured to electrically coupled to bridge connected MOSgated devices of a three phase MOSgate control inverter/bridge of the starter/alternator system, the control ASIC

including all control circuitry required to control a starter/alternator machine of the starter/alternator system.